



## SCIENCE FOR WALES

### A STRATEGIC AGENDA FOR SCIENCE IN WALES

#### *A stakeholder response from Higher Education Wales*

#### ABOUT HIGHER EDUCATION WALES

Higher Education Wales (HEW) represents the interests of Higher Education Institutions (HEIs) in Wales and is a National Council of Universities UK. HEW's Governing Council consists of the Vice-Chancellors of all the HEIs in Wales. HEW provides an expert resource on the Welsh Higher Education sector.

#### INTRODUCTION

1. The draft strategic agenda outlined in the stakeholder consultation is a particularly helpful point of departure for discussion of how the Welsh Government should approach the overall area of science and innovation. It presents one of the most comprehensive pictures - perhaps the most comprehensive picture - of scientific activity and its application in business that has been produced in Wales.
2. Since 2005 Higher Education Wales has long advocated the appointment of a Chief Scientific Adviser for Wales (CSAW). The appointment of Professor John Harries in 2010 marked a watershed in the development of Wales's science and research policy. University leaders have had the opportunity to meet Professor Harries who has been assiduous in ensuring that he has visited all the relevant science research establishments in Wales and benefitted from the advice of those running Wales's research and science operations. HEW's own Research Advisory Group has appreciated the opportunity to discuss the science framework with Professor Harries. HEW also welcomes the establishment of the Science Advisory Council for Wales in 2010. This has already proved to be a useful reference group for advice from the range of informed experts in science and research in Wales.
3. This consultation response addresses the issues raised in the stakeholder consultation, directly outlining a chapter-by-chapter response corresponding to the structure of the consultation. We pick out and respond to, as appropriate, some of the key relevant recommendations as they address the university sector. Given the short timescale and timing of the consultation we have not been able to go into as much detail as we might in other circumstances. We hope that there will be an opportunity to do so as we move forward to implementation of the strategy.

### **(a) Three underpinning principles**

4. It is worth stating upfront our views on some important matters. We would like to highlight three principles for the implementation of the science framework ensuring that Wales makes a success of *Science for Wales*. The principles are:
  1. The critical need for sustainability in research investment underpinning Wales' science base.
  2. The need for improved levels of research collaboration between universities in Wales (and beyond Wales).
  3. Higher levels of cross cutting work between Welsh Government departments.
5. The first principle is clearly crucial to the longer term development of our science and research base. The sustainability of science and research activities is a *sine qua non* without which any attempt to lead a step change in Wales's scientific profile would fail. Much work has been done at the UK level - with the assistance of HEFCW - through TRAC and Full Economic Costing to ensure that research in the UK is sustainable. The cost – and benefits – of science research is high but without predictable and consistent levels of investment to underpin such activities, innovative new activities in line with Science for Wales may not take flight. This is an issue for universities also in relation to the sustainability of STEM teaching in the new fees and funding regime. It will be important for universities to receive an appropriate premium through HEFCW's new Public Investment Fund (from 2012/13) to reflect the additional cost of teaching STEM subjects (and other subject areas) which was directly reflect in the previous teaching funding arrangements but is not directly reflected in tuition fee levels. This has been the subject of a recent HEFCW consultation to which HEW has responded.
6. On the second principle HEW subscribes to the view that a step change in the levels of collaboration between universities is required in order to advance the agenda outlined in Science for Wales. This should apply both between universities in Wales and beyond Wales. Reconfiguration of the higher education sector which will occur in the coming period will be of benefit to Wales generally and of particular benefit to researchers and users of science.
7. The third principle – cross cutting departmental work within the Welsh Government – is also pivotal. The responsibility for investing in science and research currently falls between four Welsh Government departments (NHS Wales, BETS, DfES, and WEFO in relation to Convergence) and one Welsh Government Executive Body (HEFCW). This poses significant challenges for the consistent advancement of a coherent approach to the development of science and research in Wales. The role of the Office of the CSAW will thus be essential in

helping to drive the science agenda within government to the benefit of all sectors concerned.

**(b) The strategic agenda itself**

8. The strategic agenda set out in the stakeholder consultation paper is rightly a broad and ambitious one. It addresses science research in Wales wherever it is located and the vitally important STEM supply chain. We welcome the attention and work that has clearly been devoted to its production. The document presents a penetrating analysis of the current situation and some constructive recommendations and plans for addressing some of the matters set out in the document. There is constructive criticism of universities and others - something we welcome and accept head on.
9. In terms of timing, Higher Education Wales believes that the key matters raised in the document need to be advanced as a matter of urgency. A confluence of several important factors makes the publication of an 'overview plan', as it is described in the document, an imperative from the perspective of universities, and these factors include:
  - The strategic agenda to deliver a reconfigured and stronger HE sector in Wales better equipped to deal with the challenges for higher education in the twenty first century.
  - The importance of science and research in the EU's landmark Europe 2020 strategy, the scale of 'calls' under Framework Programme 7 (and its successor Horizon 2020 – running at €10bn+ a year) and the European Commission's apparent redoubled emphasis on research and development in the successor programme to Convergence.
  - The shift among research councils to larger strategic scale collaborative projects, cross cutting research themes ('the grand challenges') requiring interdisciplinary work, and Doctoral Training Centres.
10. In this context the status quo is not an option for universities in Wales. This is why we will be an enthusiastic co-leader in the implementation of the final Science for Wales strategy.

**SCIENCE AND THE ECONOMY**

11. The draft strategic framework is right to focus on the economic transformation that successful European and world regions have achieved by concentrating on the science and innovation agenda. We need not recite the reasons for emphasising the importance of science, innovation and high level skills as these have been widely highlighted, including in HEW's own document *Investing in the Upturn* (Jan 2011).<sup>1</sup> As we highlight in this document, the opportunity for Wales to benefit from improved outputs and outcomes in science and

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<sup>1</sup> See [www.hew.ac.uk/EN/Publications/Documents/Final%20Investing%20for%20the%20Upturn%20Full%20English%20Version%20-%20Jan%202011.pdf](http://www.hew.ac.uk/EN/Publications/Documents/Final%20Investing%20for%20the%20Upturn%20Full%20English%20Version%20-%20Jan%202011.pdf)

innovation is substantial. Wales's economy has the potential for significant growth and development, given that we have the lowest rates of both productivity and GVA per head in the UK.

12. The emphasis on longer term investment in the research and innovation base is also a very positive statement in this section, especially at a time of unprecedented public expenditure restraint. The maintenance of levels of public investment in research in Wales will be essential in maintaining our economic competitiveness. This is particularly important when international level investment in science and innovation continues to power ahead in places like China and Singapore, and even in those countries facing greater fiscal challenges such as the United States.
13. Despite these fiscal challenges it is important for us to set our ambitions at a high level. Low ambitions will only compound the challenges Wales faces in improving its overall performance in science and innovation. In shorthand, our aims must be:
  - For Wales to catch up with other parts of the UK on the proportion of research income gained in the STEM areas from the UK Research Councils, the EU and the TSB.
  - For Wales to capture the UK's impressive wider share of EU innovation and research funding through the Framework Programme 7.
  - Through this enhanced activity, for the Wales to begin to attract companies and other operations so that we might begin the process of forming 'clusters' or 'hubs' of high technology industries in parts of Wales, creating jobs across the value chain.
14. On this last point North Wales and South Wales's proximity to Manchester airport and Heathrow airport means that Wales is close to the 'super-region' of London and the South East and the Manchester technology cluster. Our long term ambition must be to turn the M4 and A55 corridors into 'knowledge highways' modelled on the Connecticut -Western Massachusetts 'Knowledge Corridor'.
15. Such an aim would sow the seeds for wider economic development that would see Wales moving up the UK and EU prosperity and productivity league. For as we point out in our document *Investing in the Upturn* (pp.13-14), government sponsored research shows that the majority of net new job growth in Wales in the next five years is projected to come in areas (managerial, professional and technical) where graduate skills will increasingly be the norm. Success in this agenda would generate employment *at all levels* within the economy.

## University-business links

16. The strategic agenda rightly outlines the crucial role of university-business links to Wales's future prospects. The Confederation of British Industry's (CBI's) report, *The Shape of Business: The Next 10 Years*<sup>2</sup> foresaw more businesses partnering with universities to undertake shared R&D as a means of carrying out innovation activity which would otherwise be constrained by their finances.
17. The CBI has recently stated "research and its outcomes are only part of a bigger picture of the benefits of interaction...which flow from a company's university engagements."<sup>3</sup> Universities have a critical role to play, not only in translating the fruits of leading-edge research to high-tech businesses, but also in supporting the full range of business types – from global corporations to microenterprises – and business processes which lead to higher productivity through improvements in products and services. The role of universities in this is crucial - NESTA estimates that in 2007 the private sector in the UK invested £133 billion in innovation, with traditional scientific R&D accounting for only 11%.<sup>4</sup>
18. Whilst change in the higher education sector is occurring at pace in some key areas stability is desirable. The overall balance between competitive funding and Quality Related (QR) research funding, which ensures a healthy and dynamic research base, is therefore not arbitrary but the result of a number of decisions made to secure excellence and sustainability within the system as a whole. QR underpins the sustainability of research, which is so critical to the continued performance of the science base, and such investment would simply not be provided by private sources or other Welsh Government funding streams. A recent Universities UK report demonstrates the role of QR in underpinning the diversity and flexibility of the UK research base.<sup>5</sup>

## AN OVERVIEW OF SCIENCE IN WALES

19. Higher Education Wales welcomes the survey of science activity that is contained in the strategic agenda. In balancing the many areas of improvement needed in science and research within Wales it is also right to highlight, as this section does, that "there is much exciting, ingenious and world-leading science being done. 'World-leading' is evidenced by scores in the Research Assessment Exercise (RAE) 2008, in publication and citation measures." In 2010 HEW commissioned its own research from Evidence Ltd<sup>6</sup> on the

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<sup>2</sup> See: [www.cbi.org.uk/pdf/20091123-cbi-shape-of-business.pdf](http://www.cbi.org.uk/pdf/20091123-cbi-shape-of-business.pdf)

<sup>3</sup> See the 2010 CBI publication, 'Business University Collaboration for research and innovation', p.9  
<http://www.cbi.org.uk/pdf/20100729-cbi-business-university-collaboration-guide.pdf>

<sup>4</sup> Shanmugalingam, S et al (2010) *Rebalancing Act* NESTA,  
[http://www.nesta.org.uk/library/documents/rebalancing\\_act\\_080610.pdf](http://www.nesta.org.uk/library/documents/rebalancing_act_080610.pdf)

<sup>5</sup> Universities UK (2009) 'Securing world class research in UK universities' accessible at  
<http://www.universitiesuk.ac.uk/Publications/Pages/SecuringWorldClassResearch.aspx>

<sup>6</sup> Thomson Reuters, 'The capture of research income by Welsh Universities', November 2010.

success of the sector in gaining research council income (contained as an Annex to this document). The valuable evidence base generated from this report in identifying strengths and challenges for the sector has been examined by Vice-Chancellors and the HEW Research Advisory Group.

20. Improvements have been made in the quality of research outputs in recent years. Our 'running faster' is demonstrated in recent research published by the Campaign for Science and Engineering in the UK which states that Wales ranks 16<sup>th</sup> in the world for citations per scientific (including social scientific) paper - and that citations per paper is very close to Wales's UK population benchmark.<sup>7</sup> According to this citation analysis higher impact areas for universities in Wales are achieved in "plant and animal science, as well as computer sciences, social sciences, psychology and psychiatry." This may mean that the quality of the work being produced in Wales is generally of a high standard compared to other nations worldwide, but that there is not enough of a quantity of such work taking place across Wales. This conclusion may be supported in the conclusion of a HEFCW sub group on research in Wales (chaired by Professor Robin Williams), which concluded that an "important factor appears to be that the proportion of staff among Units of Assessment in Wales is anomalously low in those disciplines relating to the highest spending Research Councils."<sup>8</sup>
21. It is the case, however, that a substantial increase in the volume and quality of research will require significant investment, including public investment. Research in STEM is more expensive to conduct than research in the social sciences or the humanities. The combined effect of the lack of UK National Research Institutes and the historic underinvestment in higher education in Wales generally means that there has been substantially less resource committed to science and research in Wales than England or Scotland over the decades.<sup>9</sup> The Learned Society of Wales estimates that there is a £361m cumulative university investment gap with England over the period 2000-09 and a cumulative investment gap of over £1bn in the same period with the Scottish HE sector. According to a recent report Wales's share of the UK's total QR research grant stands at 4.5%, falling short of our 5% population benchmark.<sup>10</sup>
22. In some specific areas, investment from the Convergence Programme has helped to ensure that some key research projects, particularly the Low Carbon Research Institute, has the

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<sup>7</sup> 'Science, Engineering and the Devolved Nations – CASE Policy Report', the Campaign for Science and Engineering in the UK, no.11 Apr 2011, p. 7.

<sup>8</sup> See §2.1 (iii) of the report which can be accessed here:

[http://www.hefcw.ac.uk/documents/council\\_and\\_committees/council\\_papers\\_and\\_minutes/2011/11%2007%20Annex%20A%20Research\\_Subgroup%20report.pdf](http://www.hefcw.ac.uk/documents/council_and_committees/council_papers_and_minutes/2011/11%2007%20Annex%20A%20Research_Subgroup%20report.pdf)

<sup>9</sup> See

<http://learnedsocietywales.ac.uk/sites/default/files/WAG%20SUPPORT%20FOR%20UNIVERSITIES%20IN%20WALES%20%20-%20COMMENTS%20OF%20THE%20COUNCIL%20OF%20THE%20LEARNED%20SOCIETY%20OF%20WALES%20EN%2001%2003%202011.pdf>

<sup>10</sup> 'Science, Engineering and the Devolved Nations – CASE Policy Report', cited above, p.7.

resources to pursue a significant research programme of an internationally recognised scope. The levels of investment in this project - and in the High Performance Computing (HPC) Wales project - needs to be seen as a template in terms of investment for other areas of STEM research. Both these projects are widely collaborative, interdisciplinary, engage with the public and users, and address important 'grand challenges'.

## **STRENGTHENING SCIENCE AND INNOVATION IN WELSH UNIVERSITIES AND BUSINESSES**

23. Proposals in relation to new research institutes in the strategic agenda are ambitious. We see the research and development base in universities as being the key to developing Wales's science and innovation performance, noting that some literature supports this viewpoint.<sup>11</sup> We hope that the valid reference to Max Plank Institutes or Fraunhofer Institutes, indicates that there is an intention to found separate research institutes outside university structures, as such a plan would have significant disadvantages.
24. The establishment of wholly new structure may seem appealing until one considers the start up and ongoing costs of erecting entirely new organisational structures. In an age where interdisciplinary research is increasingly important in making progress on the borderline of knowledge, basing research in universities where interdisciplinary practice is becoming the norm (rather than separate single discipline research institutes) seems to have strong advantages. Universities, with their established commercial offices and European offices, also have the capacity to maximise the knowledge exchange and external research income value added from research. To duplicate such functions in a new separate research institute would be expensive. By developing research institutes within universities such 'on costs' are borne at a marginal level which allows any new investment in science and research in Wales to go to the frontline.
25. We therefore welcome the proposed feasibility study in this section for four new research centres based in universities in Wales. It is possible that a new and clear brand could be attached to new or developed research centres in Wales achieving world class outputs. The previous 'National Research Centres' badge (used in the period 2008-11) may not have had the impact that some had hoped for in terms of a clearly identifiable brand.

### **(a) Links between STEM and the Social Sciences**

26. It should also be noted that Wales has research strengths in the social sciences. As is widely recognised, Wales receives its population benchmark of research council income in the social sciences and has research centres of genuine strength. Given the positive impact of finance, business, economics, and the fact that Wales 'punches its weight' in the external research income it receives from these areas, it would make sense to include these areas in

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<sup>11</sup> Adams J (2000) 'The Future of Research', in Scott P (ed) *Higher Education Re-formed*, pp169-189.

some way within the science strategy, even if the name of the resulting product changed to a 'Science and Research Strategy for Wales'.

27. This is clearly important in the context of areas where STEM interrelates with the social sciences, such as in relation to climate change. It is accepted that the social sciences will play a crucial role in helping to address climate change through their understanding of human behaviour and how citizens may be helped to understand the consequences of their behaviour and make appropriate changes to their lifestyles.

### **(b) Universities - Taking a collaborative approach**

28. The call, in the consultation, for “a more co-ordinated approach” between universities is an important one, and one we take seriously. Since 2005 a series of major collaborative research centres, funded by HEFCW and other sources, have been founded. These centres have demonstrated improved performance in research outputs and income from external sources. They include:

- The Research and Enterprise Partnership between Aberystwyth and Bangor Universities
- The Wales Institute of Cognitive Neuroscience
- The Wales Institute of Mathematical and Computational Sciences
- The Low Carbon Research Institute
- Wales Institute of Social and Economic Research, Data and Methods
- Biosciences and Environment Alliance/IBERS
- Wales Institute of Visual Computing (Bangor University, Aberystwyth University, Cardiff University and Swansea University)

According to HEFCW, the public investment in these collaborative research centres is roughly of the same proportionate order as the investment made by the Scottish Funding Council in their 'research pooling' exercise, a fact rarely acknowledged in discussions of public funded research collaborations across the UK.

29. Since 2006 a series of collaborative networks have been formed to facilitate cross working in higher education:

- **Higher Education Wales Research Advisory Group** – All of Wales's Pro-Vice Chancellors for Research meet regularly to review research issues and look at performance, reporting to Wales's Vice-Chancellors.

- **Welsh Research Liaison Officers** – A group formed in 2009 to share good practice on matters such as research mentoring and technical aspects of research management.
- **Vitae Wales and South West**<sup>12</sup>- A hub that champions the personal, professional and career development of doctoral researchers and research staff in higher education institutions and research institutes.
- **Wales Higher Education Brussels** – a Brussels based office co-funded by HEFCW and universities linking Welsh researchers and university leaders with opportunities and developments in the EU.

Higher Education Wales is currently compiling an inventory of university research facilities in Wales which will allow HEIs the opportunity to make more efficient use of their facilities by sharing them or hiring them out. This should also be used as an opportunity to initiate research collaborations where appropriate. The inventory will be complete and available in 2012.

30. Wales is ‘running faster’ in terms of producing more research than we ever have before, but others in the UK and beyond are also accelerating the pace of the development of their academic work. It is therefore not just a question of making further progress in this area but a matter of metaphorically catching up and overtaking the gains also being made by others in the race. This will be the challenge faced by universities in Wales.

### **(c) Communicating Success**

31. The focus on communications in this section is helpful and positive. It is true that universities and others have not always been adept at maximising the publicity surrounding key research initiatives. However, this is changing already with the work of Higher Education Wales and Wales Higher Education Brussels. HEW, for example, in July 2011 jointly presented with the Climate Commission for Wales a showcase event in the SWALEC stadium in Cardiff on climate change and sustainability research across universities. More such activities are planned in future. WHEB has also hosted a series of seminars in Brussels to publicise with EU officials and politicians the collaborative STEM skills projects and research projects. This is the beginning of a wider effort to co-ordinate the publicity of important developments across the higher education sector in the coming period.

### **(d) Attracting Research Stars**

32. The proposals that universities should recruit more research ‘stars’ is a positive one. This is something that the HE sector has done in the past and continues to do. Wales has, for instance, recently attracted some of the cream of the world’s talent to Wales (such as the Nobel laureate Professor Robert Huber) and some other highly regarded researchers. More on this type of ‘streetwise’ work clearly needs to be done and we would welcome any practical assistance that may be offered by the Welsh Government or HEFCW in this area.

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<sup>12</sup> <http://www.vitae.ac.uk/policy-practice/1754/South-West-and-Wales-Hub.html>

However, the cost of bringing in not only top research stars but also their research teams and the facilities they may need is not to be underestimated. We would also not wish to neglect the development of early and mid career researchers working within Wales, the next generation of whom we would hope will produce some home grown 'research stars'.

### **(e) EU Funding**

33. HEW would wish to emphasise that the Convergence programme in Wales is a vital part of the machinery needed to equip Wales for research competitiveness. The university sector does not see the Convergence programme as an alternative for external research funding, as somehow analogous to Research Council grants. The Convergence Programme has a specific and explicit role in building capacity and developing the capabilities to conduct targeted research and development with partners, and it includes a significant element of capital investment.
  
34. Indeed, it is the objective of many ERDF convergence projects that the resources flowing into the project should result in outputs that include improved performance in bidding for competitive research grant funding. To think of the Convergence Programme as an alternative to research income from the Research Councils or the Framework Programme is not accurate and does not represent the views or actions of university leaders. Universities in Wales work to maximise the value from funding across all R&D income streams. The Convergence Programme is a valuable route for such investment and we hope and expect that the projects funded under the programme will very much be seen as a key element of the sector's armoury in winning wider research grants. There are issues about whether existing WEFO and EU rules make it difficult to recognise HE research capacity, infrastructure and skills as formal outputs resulting from EU Convergence Funding.

### **THE PRIORITY PROGRAMME**

35. The Welsh Government priority programme itself is an important advance in Wales's economic development and research policy. Since the Welsh Assembly Government cabinet set out its research, development and skills priorities in 2008 a greater focus has been brought to bear on where joint working will be given precedence. This was confirmed and strengthened with the publication of the *Economic Renewal: a new direction* in July 2010.
  
36. HEW believes that it will be important to draw together the appropriate linkage between the four research priority areas reaffirmed and three thematic areas proposed in the strategic agenda with the key fields targeted by the European Commission and Framework Programme 7 (and its successor Horizon 2020). This is already being done through work which has just commenced, led by Wales Higher Education Brussels, which has been communicated to the CSAW separately. For example, WHEB's newly established European Research Coordination Groups are taking forward ideas for collaborative bids to the

Framework Programme 7 specifically in the priority research areas specified by the Welsh Government.

37. Some of the suggestions contained in the strategic agenda for creating more of a coherent research community around the priority areas are very positive – including the idea of an annual meeting of scientists, a Wales science prize, and keynote lecture. Though small steps in themselves, they may in time add to more than the sum of their parts by helping to profile research in Wales and gel the research community more effectively. The university sector in Wales has attempted to help create some of this civil society engagement and community identity through the work of the Learned Society in Wales, which was launched in May 2010.
38. The idea proposed in *Science for Wales* in relation the merged academic departments in STEM is an interesting one, though thought will have to be given as to how this may be possible to jointly teach where the geographical locations involved are significantly separated, as they often are in Wales. Joint REF submissions could be a different or complementary way in which departments can work more closely together on research outputs. Where this occurred in Wales in RAE2008 it was thought that there were benefits to such arrangements - though establishment of such arrangements is undoubtedly a complex process.

**(a) STEM Supply chain and public engagement**

39. Higher Education Wales would be happy to participate in work to help improve coordination of the STEM Outreach Programme in Wales. This is a priority area for the higher education, sector as a central aspect of the STEM supply chain is the engagement of learners.

**(b) Inward investment, Anchor companies and Foundation Companies**

40. HEW agrees with the strategic agenda document that “the Foundation company idea as a powerful vehicle for government-industry joint work in other areas, also.” We would wish to see the foundation company / joint investment vehicle approach become a key aspect of Wales’s science strategy and inward investment approach.
41. We would note that in recent evidence to the House of Commons Welsh Affairs Committee, Glen Massey, a former adviser to the Welsh Government and author of a ‘*Review of International Wales*’, highlights the changed landscape for foreign direct investment (FDI) in Wales and the potential for using major university-business links as a key lure for attracting companies to Wales:

“The FDI that is coming into the UK now is not really looking for regional selective assistance; that is inappropriate. As a consequence of that, we should have developed a suite of other instruments - whether it be skills, a property proposition or R and D through universities, a whole raft of things-to make things attractive to inward investment

companies. We have not done so. I think there is a recognition in Wales that something needs to be done, and I still think it is in the process of trying to figure out what it is.”<sup>13</sup>

42. The Foundation company approach should be one central way in which the Welsh Government could deliver sustained inward investment. The innovative approach taken in relation to the EADS Foundation should give us the confidence to move forward in this area with some drive and ambition.

### **(c) TICs and Enterprise Parks**

43. HEW would welcome the location of a Technology and Innovation Centre (TIC) in Wales, or a TIC that spanned Wales and another UK regions. The Welsh Government may wish to consider how its plans for an Enterprise Park(s) in Wales may marry up with the possibility of a TIC. Use of the Convergence Programme may clearly add some value to any such proposal.

## **CONCLUSION - THE WAY FORWARD TO DELIVERY**

44. The implementation of ‘Science in Wales’ has the potential to contribute in a major way to creation of a knowledge based economy in Wales. The CSAW will have the support of HEW in ensuring that the final strategy has a maximum impact on the frontline delivery of science and innovation.
45. We note that the scope of the expected strategy, as outlined in section 6, is very broad. The breadth of the proposed activities is helpful, though we would recommend that a clear prioritisation takes place between the range of proposals outlined in this section, as some will be crucial to the success of the strategy while others will be helpful but not pivotal to its delivery. In particular we believe that there should be a clear focus on next steps in a small number of STEM areas with targeted additional investment allocated to specific priorities or research centres. Investment is important here – big advances will not be made through collaboration unless *additional* public resources also come in to back up such efforts. Resource levels must catch up with the rest of the UK if we are to see a genuine transformation of the science and research base.
46. The suggestion of an ‘overview plan’ is a helpful one. We hope that the final science strategy will provide the outline of such an overview plan so that Higher Education Wales and other bodies may take the lead from such a document. This may be done in a variety of ways as a number of senior bodies currently meet to consider research and science issues in Wales, including:

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<sup>13</sup> Oral evidence taken before the Welsh Affairs Select Committee on 14 June 2011:  
<http://www.publications.parliament.uk/pa/cm201012/cmselect/cmwelaf/c854-v/c85401.htm>

- The Science Advisory Council for Wales.
- HEFCW's Research Innovation and Engagement Committee (chaired by Professor Robin Williams FRS, which advises the HEFCW Council).
- Higher Education Wales's Research Advisory Group (PVCs for Research).
- The Higher Education Wales Committee (comprising Wales's Vice-Chancellors and the Director of the Open University in Wales).
- Wales Higher Education Brussels Board.

We would be happy to meet with the CSAW in the coming weeks to discuss the best way in which we can implement the final strategy with the forums above.

## **HIGHER EDUCATION WALES**

**SEPTEMBER 2011**